

Validation of a Screening Instrument for Posttraumatic Stress Disorder in a Community Sample of Bedouin Men Serving in the Israeli Defense Forces

Yael Caspi

Department of Psychiatry, Rambam Medical Center, Haifa, Israel

Eve B. Carlson

National Center for PTSD, Department of Veterans Affairs, Palo Alto Health Care System, Menlo Park, CA

Ehud Klein

Department of Psychiatry, Rambam Medical Center and B. Rappaport Faculty of Medicine, Technion–IIT, Haifa, Israel

This study evaluates the performance of the Screen for Posttraumatic Stress Disorder (SPTSS) in the assessment of a high-risk ethnic minority sample. Participants included 317 Bedouin men serving in the Israeli Defense Forces (IDF), who disclosed extensive trauma and loss. The sensitivity and specificity of the SPTSS were calculated using the Structured Clinical Interview for DSM-IV (SCID) as the criterion for posttraumatic stress disorder (PTSD), which was diagnosed in 14.5% of respondents. Receiver operating characteristic (ROC) analysis using the SPTSS total mean scores maximized classification accuracy at a cut point of 5.5, yielding equal sensitivity and specificity rates of 89%. Likelihood ratios indicated that men with positive screens who did not meet criteria for PTSD were likely to report significant emotional distress and functional impairment.

There is an increasing awareness among mental health administrators and professionals that the understanding of factors associated with culture and ethnicity is fundamental to the planning and provision of appropriate, accessible, and effective mental health assessment and treatment services (DHHS, 2001). Given the spread of culturally diverse populations worldwide, diagnosis across cultural boundaries has become a challenge facing psychiatry in the 21st

century (Fabrega, 2001) as well as a matter of practical importance for clinicians in urban mental health and primary care settings (Kirmayer, Groleau, Guzder, Blake, & Jarvis 2003).

The ethnocultural aspects of an individual's response to trauma and posttraumatic stress disorder (PTSD; Glassman, 1988) demonstrate the need for cultural sensitivity in trauma assessments (Manson, 1997). Efforts

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Correspondence concerning this article should be addressed to: Yael Caspi, Department of Psychiatry, Rambam Medical Center, P.O. Box 9602, Haifa 31096, Israel. E-mail: y_caspi@rambam.health.gov.il.

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have been directed at the cross-cultural adaptation of well-established instruments designed to measure trauma-related problems, primarily PTSD, depression, and anxiety (Hollifield et al., 2002).

Ethnicity has also been found to increase vulnerability to psychological risk following war-zone duty (Sutker, David, Uddo, & Ditta, 1995). Indeed, veterans from ethnic minority backgrounds may have fundamentally different experiences during service, such as higher levels of combat stressors (MacDonald, Chamberlain, & Long, 1997) and exposure to adverse race-related events (Loo, Fairbank, & Chemtob, 2005), as well as added difficulties in the readjustment period following discharge (Brende & Parson, 1985).

BACKGROUND: THE BEDOUINS

The circumstances of Israel's Bedouin citizens—a minority within the Arab minority—and one of a few ethnic minority groups of servicemen within the Israeli Defense Forces (IDF) are unique and complex. Of Arab ethnicity and Muslim faith, these historically nomadic tribes are located primarily in the Negev, Israel's southern desert area (~110,000) and in the northern parts of the Galilee and the Jezreel valley (~50,000). The latter group has been settled in small communities since the days of the British Mandate (Falah, 1983) and joined the Jewish military forces during the struggle for the establishment of the State of Israel, continuing to volunteer for service in the IDF ever since (Ben-David, 2006). Struggling to preserve a predominantly traditional lifestyle in the midst of the growing progressive Western influences, the Bedouin communities are organized around a tribal social structure with marriages prearranged within the extended family. Bedouin men serve primarily in combat units and are renowned for their exceptional skills and professional capabilities as trackers, considered to be the “eyes, ears, and nose” of the military force (Havakook, 1998). Accurate figures of the number of Bedouin casualties are difficult to find and there are no official estimates of the rate of trauma exposure and trauma-related problems among Bedouin servicemen.

Only a handful of Bedouins come to the attention of the mental health system, mostly men with delayed and complex manifestations of posttraumatic symptomatology, who can no longer be cared for at home due to violent or psychotic behaviors. Those with less severe conditions do not seek mental health care, apparently because of the stigma and social ramifications involved—a commonly observed phenomenon in ethnocultural minorities (Marsella, Chemtob, & Hamada, 1990; Norris & Alegria, 2005). It seems likely, therefore, that there are many more veterans whose posttraumatic reactions remain undetected and untreated.

The current report examines the performance and psychometric properties of the Screen for Posttraumatic Stress Disorder (SPTSS; Carlson, 2001) for the assessment of PTSD in a community sample of Bedouin men serving in the IDF. There are multiple factors that place this group of servicemen at a high risk of developing trauma-related problems. Not only are they a minority group within the predominantly Jewish defense forces, they are also of the same ethnic and religious affiliation as the Palestinians against whom they are fighting. Indeed, over the past few years, service in the IDF has been increasingly criticized from within the Bedouin community. In addition, cultural norms and values create barriers to help-seeking behavior and health services utilization (Borkan, Morad, & Shvarts, 2000), especially mental health services (Al-Kranawi, 2002). For these reasons, validation of a brief screening tool for the assessment of PTSD symptoms in this unique and previously unstudied group would be valuable.

METHOD

Participants

Participants in this study were Bedouin men serving in the IDF for various periods. Three hundred seventy-two men were identified through community outreach efforts, of whom 348 (93.5%) agreed to participate. Of those, 317 men (91%) actually completed the interview.

Participants averaged 30.4 years of age ($SD = 8.4$), were predominantly married (57.1%) or single (41.3%), with only a few divorced or separated (1.6%). The mean years of schooling was 11.6 ($SD = 2.3$). More than half of them (58%) reported having children, with a mean of three live births ($SD = 2.5$) and as many as 12 children. Nearly half (48.6%) described themselves as traditional and half (47.6%) as secular with only a few (3.8%) who considered themselves religious. Total time in service ranged between 1 month and 29 years, with a mean of 70.4 months ($SD = 76.4$; approximately 6 years), so that most of the participants (62%) were in service less than 5 years, 19% between 5–10 years, and 19% between 11–29 years. Three quarters of the sample (74.5%) served in combat positions (in descending order—as trackers, in the infantry, in specialized units trained in urban fighting, and in the border police). The rest were enlisted with the civilian police or in other noncombat units (e.g., the education or transportation corps). Those serving in combat units averaged 4 years more in service than those serving in noncombat units ($t = 6.92$, $df = 241$, $p < .001$). Less than half of the sample (42%) was still in service at the time of the interviews and of the 183 discharged, 38% were unemployed. Of all respondents, 12% were receiving benefits for some service-related disability.

Procedure

Households associated with the IDF were identified by local recruiters from the five tribal families in the village. The recruiters went door-to-door and handed out written descriptions of the project in Hebrew and Arabic to all eligible households with a letter from the study's principal investigators addressing study's goals and confidentiality of information. Contact information sheets were filled for those who agreed to participate and they were later contacted by phone by the interviewers. Referrals to additional households were made by the participants themselves. Up to six contact attempts were made to set an interview time until potential participants were considered to have declined participation. Written informed consent was obtained following verbal face-to-face explanation of

the study's goals and confidentiality issues. Monetary compensation was given at the end of the interview, which took about $1\frac{1}{2}$ hours to complete. Recruitment continued for approximately 19 months until the flow of new names subsided.

As expected from initial meetings with key informants, the participants were highly proficient in Hebrew as a result of their military service, and preferred to be interviewed in Hebrew by non-Arab research assistants. Speaking in Hebrew appeared to make disclosure of emotional problems and trauma exposure easier for these men because it reduced the cultural stigma associated with such disclosures. All but five interviews took place at the participants' homes after informed consent was obtained. The five who felt that confidentiality would be difficult to guarantee at home were interviewed in a place of their choice. All administrative forms were translated from Hebrew into Arabic. The scales were translated, back-translated from English into Hebrew, and then from Hebrew into Arabic to ensure cultural appropriateness and item accuracy. The research assistants, graduate students from the Department of Psychology at the University of Haifa, were supervised by the corresponding author and trained in cross-cultural and structured clinical interviewing.

Measures

The interview schedule incorporated several established scales with items adapted or generated specifically for this study. All instructions and items, including self-rated scales, were read aloud and responses were recorded by the interviewers.

Stressful and traumatic experiences were drawn from a list of 13 items (the Appendix), developed in collaboration with Bedouin key informants, which included a senior social worker, a primary care physician, a nurse, a teacher, and two servicemen. Traumatic events that meet the definition of the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV*; American Psychiatric Association, 1994) PTSD Criterion A were included in items 1, 2, 5, 12, and 13 (near fatal or fatal car accidents, near fatal or fatal other accidents, experiencing or

witnessing assault, war-related traumas and other traumas). Additional items included events such as sudden death of somebody close, serious risk to the life of somebody close, surviving a serious life-threatening illness, witnessing domestic violence as a child, and experiencing physical abuse in childhood. Because of cultural sensitivities, questions about sexual abuse or rape were not included. In addition to endorsing the items, respondents were requested to describe the specific experiences in their own words.

Psychiatric disorders were established by the Hebrew version of the Structured Clinical Interview for DSM-IV (SCID; Shalev, Abramovitz, & Kaplan DeNour, 1996). Because trauma experiences that meet criterion A of the *DSM* PTSD criteria were already determined by the list of traumatic events, the SCID gate question for PTSD was not used.

Symptoms of PTSD were assessed with the SPTSS (Carlson, 2001¹), a relatively new tool that was selected for use in this study due to several attributes: First, the SPTSS does not link the *DSM* symptom items to a single event. There are growing indications that exposure to multiple traumas is actually more likely than exposure to a single event in most clients or research participants. The requirement therefore to link responses on different scale items to a single traumatic event may not be appropriate and it is unclear whether those who have experienced more than one traumatic event can reliably assign symptoms to a particular event and—with multiple traumatic stressors—whether symptoms actually are phenomenologically related to only one event. Furthermore, the ability of the individual to connect symptoms to a particular event is not required by *DSM-IV* criteria for PTSD. Second, because the SPTSS does not key symptoms to any particular traumatic event, it can be used to assess individuals suffering from posttraumatic symptoms who are reporting any number of traumatic events or none at all, in clinical as well as nonclinical settings. It thus bypasses the reporting barrier created by the respondents' own assessment of events as not severe enough to be considered traumatic,

a likely concern in the evaluation of participants from non-Western backgrounds. Third, the fact that the SPTSS inquires about frequency rather than distress as does the Posttraumatic Stress Checklist–Civilian Version (PCL-C), a similar 17-item self-report measure of PTSD symptoms that also does not key items to a single event, may be advantageous in populations such as combat veterans who are reluctant to report vulnerable emotions. In addition, the SPTSS describes symptoms from a first-person perspective, requires a low-reading level (Flesch–Kincaid grade level 6.8; Carlson, 2001), and employs a simple 10-point scale, eliciting responses from 0 (*Never*) to 10 (*Always*) to the directive “how much that thing has happened to you during the past two weeks.” Finally, the SPTSS takes only 3–5 minutes to complete.

Respondents who received a SCID-based DSM-IV PTSD diagnosis also completed the Posttraumatic Stress Scale (PSS; Foa, Riggs, Dancu, & Rothbaum, 1993). This 17-item questionnaire assesses severity of posttraumatic symptoms during the preceding two weeks on a 4-point Likert scale ranging from 0 (*not at all*) to 3 (*very much*). The total severity score, ranging from 0 to 51, is calculated as the sum of participants' ratings on the 17 items.

Symptoms of depression and anxiety were assessed with the Hopkins Symptom Checklist-25 (HSCL-25). This 25-item version is one of several versions of different lengths derived from the Hopkins Symptom Checklist (HSCL), a well-known and widely used screening instrument (Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974). The HSCL-25 uses 10 items from the HSCL-58 anxiety cluster and 13 items from the depression cluster plus two items describing somatic symptoms. It was translated into a variety of languages and successfully used as a screening instrument for major depression and as a measure of symptom improvement with multiple non-Western groups (Kleijn, Hoven, & Rodenburg, 2001; Mollica, Wyshak, de Marneffe, Khuon, & Lavelle, 1987). Responses on the HSCL-25 are scored on a 4-point scale ranging from 1 (*not at all*) to 4 (*extremely*). The scale has shown satisfactory validity and reliability and a cut-off point of 1.75 was established as a criterion for “caseness,” with sensitivity and specificity rates ranging between

¹ The SPTSS can be obtained from Eve Carlson, National Center for PTSD; e-mail: eve.carlson@va.gov.

69%–84% and 71%–91%, respectively (Nettelbladt, Hansson, Stefansson, Borgquist, & Nordstrom, 1993). The current study used the Arabic version of the HSCL-25 (Lavik, Laake, Hauff, & Solberg, 1999), previously employed in a study investigating the detection rate by general practitioners of mental disorders among Palestinian primary health care patients in the Gaza Strip (Afana, Dalgard, Bjertness, & Grunfeld, 2002).

The interview schedule also included items inquiring about several physical symptoms (such as stomachaches, pressure in chest, rapid heartbeats, oversweating), perceived health status (excellent, very good, good, fair, poor), perceived impairment in functioning (adaptation of items from the MOS short-form health survey (SF-36); Stewart, Hays, & Ware, 1988), and frequency of primary care and specialty health services utilization in the preceding 6 months.

RESULTS

Stressful and Traumatic Events

The most prevalent event reported was experiencing the sudden death of somebody close (82%). The type of experiences reported in this category included mostly family members killed in the military or in motor vehicle accidents, death from serious illness or heart attacks, death from suicide, murder, or accidents. Nearly 70% of the respondents experienced traumatic events during military service. These were typically compound events involving immediate danger to their own life while witnessing unit members blown apart next to them or friends dying in their presence from fatal injuries. Descriptions often involved horrifying graphic details that were disclosed by the participants for the first time.

Approximately 60% reported that a close friend or relative survived a fatal accident, severe injury, or life-threatening illness; 37% reported involvement in serious motor vehicle accidents; 33% reported witnessing somebody close being attacked; 25% were beaten up by somebody close to them; and nearly 20% received death threats or felt their well-being was in danger. Less than 1% re-

ported surviving a life threatening illness, 7% reported physical punishment in childhood, 10% were involved in a serious accident, 13% witnessed domestic violence in childhood, 14% were stalked, and 18% endorsed the category of “other events.” These included reports of siblings or children born with serious deformities or significant health concerns, close proximity to a suicide bombing, being wrongly blamed for a homicide or an assault, and being erroneously informed that a brother was killed in action.

The distribution of the total number of events endorsed by the participants ranged from 0 to 11, with a mean number of 3.9 ($SD = 2.18$); nearly 90% responded positively on more than 1 event, 50% endorsed more than 4 events, and 20% endorsed between 6–11 events.

Careful examination of the verbal descriptions provided by respondents of the events endorsed resulted in the categorization of only 234 participants (73.8% of the total sample) as reporting events that meet the *DSM-IV* Criterion A definition of trauma. These traumatic experiences fell into five domains: war-related trauma, car accidents, other accidents, terror attacks, and acts of violence. Most of those reporting Criterion A events had experiences from a single domain (71%), 26% from two, and 3% from three.

DSM-IV Diagnoses

Twenty-seven percent of the participants received SCID-based *DSM-IV* Axis I diagnoses; PTSD was diagnosed in 14.5% of the participants: 5.4% purely with PTSD, 4.0% with PTSD comorbid with major depression disorder (MDD), 1.6% with PTSD comorbid with alcohol abuse, and 3.5% with PTSD comorbid with both MDD and alcohol abuse. Accordingly, more than half of the participants with DSM SCID-derived PTSD manifested comorbidity with MDD. Major depression disorder alone or comorbid with anxiety disorder was diagnosed in 5.4% of the participants. Alcohol abuse was diagnosed in 6%; other diagnoses, mainly general anxiety disorder and panic disorder, were diagnosed in 1%. Subsequent analyses defined the group with positive SCID-based PTSD diagnosis as

Table 1. SCID-Based Axis I *DSM-IV* Diagnoses

Diagnostic categories	<i>N</i>	%
PTSD	17	5.4
PTSD + MDD	13	4.1
PTSD + alcohol abuse	5	1.6
PTSD + MDD + alcohol abuse	11	3.5
Alcohol abuse	19	6.0
MDD	20	6.3
Other	3	0.9
None	229	72.2
Total	317	100%

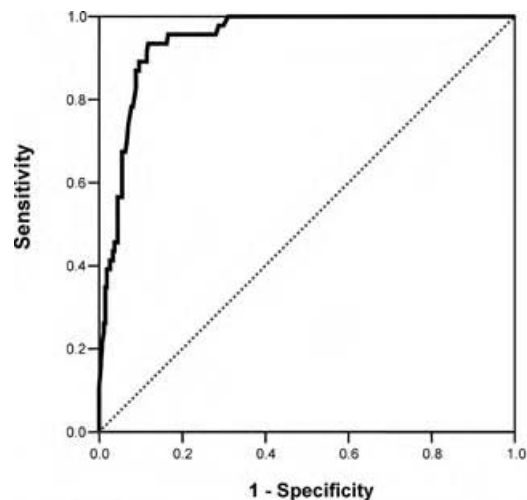
Note. SCID = Structured Clinical Interview for DSM-IV; *DSM-IV* = *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (American Psychiatric Association, 1994); PTSD = post-traumatic stress disorder; MDD = major depression disorder.

consisting of both PTSD alone and PTSD with any of the comorbid conditions.

Descriptive Statistics

The mean SPTSS score was 3.08 ($SD = 2.77$) with individual scores ranging from 0 to 10. The SPTSS mean score for those with SCID-based PTSD diagnosis ($M = 7.41$, $SD = 1.72$) was significantly higher than the SPTSS mean score for those without PTSD ($M = 2.34$, $SD = 2.17$; $MD = 5.07$, 95% CI = 4.41–5.73; $t = 15.04$, $df = 314$, $p < .001$), and higher than the mean score reported by Carlson (2001) for her original validation sample of psychiatric inpatients with PTSD ($M = 6.7$, $SD = 1.7$). Examination of mean scores on the three symptom clusters revealed that mean differences between the PTSD positive and PTSD negative groups were statistically significant for all three, with the largest difference shown for the reexperiencing cluster ($MD = 6.01$, $SE = 0.33$), followed by the arousal cluster ($MD = 5.42$, $SE = 0.38$) and the avoidance cluster ($MD = 4.15$, $SE = 0.36$).

The mean PSS score for participants with SCID-based diagnosis of PTSD was 33.14 ($SD = 12.32$), ranging from 1.00 to 51.00. This result falls within the range of means reported for participants with PTSD in previous studies (Foa, Cashman, Jaycox, & Perry, 1997).



^a SCID PTSD diagnoses include co-morbidity with MDD and alcohol abuse ($n = 46$).

Figure 1. Receiver operating characteristic (ROC) curve of Screen for Posttraumatic Stress Disorder (SPTSS) mean scores and Structured Clinical Interview for DSM-IV (SCID) diagnosis of PTSD in Bedouin men serving in the Israeli Defense Forces. The SCID-PTSD diagnoses include comorbidity with MDD and alcohol abuse ($n = 46$).

The mean HSCL-25 total score was $M = 1.61$ ($SD = 0.64$) and the depression subscale score was $M = 1.64$ ($SD = 0.66$), with individual scores ranging from 1.00 to 3.87. Thirty one percent of the respondents had mean total scores equal to or above the cut-off point of 1.75.

Validity Results

Pearson correlations between SPTSS mean scores and the total number of stressful and traumatic events endorsed indicated a statistically significant correlation of $r = .32$ ($p < .001$); a correlation of $r = .86$ ($p < .001$) with HSCL-25 mean scores; and a correlation of $r = .73$ ($p < .001$) with number of somatic symptoms. The Pearson correlation between mean SPTSS scores and mean PSS scores for those men with SCID-based PTSD was $r = 0.83$ ($p < .01$). In addition, significant correlations were also found with frequent sickness during the preceding 6 months ($r = .40$, $p < .001$), frequent visits to

primary care clinics ($r = .24$, $p < .001$), and frequent utilization of specialized medical services ($r = .33$, $p < .001$).

The sensitivity and specificity of the SPTSS were calculated using the SCID as the criterion for PTSD. The ROC analyses based on the SPTSS total mean scores (Figure 1) indicated that a cut-off point of 5.50 on the SPTSS maximized classification accuracy, with associated sensitivity and specificity rates of 89% and 89%, respectively. The area under the curve (AUC) was 0.95 (STE = .01, $p < .0001$, 95% CI = 0.92–0.97). The total hit rate, calculated as the sum of the true positives and true negatives divided by the total number of respondents was also .89. Positive predictive value (PPV), the proportion of respondents identified as positive for PTSD on the SPTSS who were also positive for PTSD on the SCID, was .58 and the negative predictive value (NPV), the proportion of respondents identified as negative for PTSD on the SPTSS who were also negative for PTSD on the SCID, was .98.

A diagnosis of PTSD was also inferred from the SPTSS by using item scores to determine *DSM-IV* criteria for PTSD (Carlson, 2001). Three different cut-offs were examined so that an individual was considered to have a positive symptom if the SPTSS item score for that symptom was, respectively, at least 3, 4, or 5. Thus, individuals were categorized as having PTSD if they scored equal to or above these cut-offs on the following: one or more of the symptoms from the reexperiencing cluster (SPTSS items 11, 13, 14, 16, 17), three or more symptoms from the avoidance cluster (SPTSS items 1, 2, 3, 4, 5, 7, 9), and two or more symptoms from the arousal cluster (SPTSS items 6, 8, 10, 12, 15). As shown in Table 2, calculations of

sensitivity and specificity indicated that while sensitivity for all three cut-offs was higher than the sensitivity associated with the SPTSS mean total score used in the ROC analysis, specificity and the associated PPVs were lower. Kappa coefficients were in the acceptable range for all three cut-offs, indicating agreement above chance between the SCID PTSD diagnosis and the different ways to generate a PTSD diagnosis from the SPTSS.

To evaluate the degree to which use of a cut-off score that lowers the sensitivity of the scale can be justified, subsequent analyses focused on the false-positives—those respondents who were positive for PTSD on the SPTSS (i.e., mean score above the ROC analysis generated cut-off value of 5.50), but did not meet SCID criteria for PTSD ($n = 30$).

First, 27% of these false-positives were still in military service compared to 17% of the true positive group (those who were positive on the SPTSS screen and also received a SCID diagnosis of PTSD). Indeed, a logistic regression analysis with both groups as covariates, revealed that the true positive group was 4.6 times more likely to have already been discharged than those with negative SPTSS screens (95% CI = 1.94–10.66), compared to an increased likelihood of only 2.6 times for the false positives (95% CI = 1.10–6.01), suggesting that these groups might be differentiated more by their functioning ability than the severity of their posttraumatic symptoms.

Comparisons with those with SPTSS scores below the cut-off indicated that the false-positive group, although to a lesser degree than the true-positive group, still reported more emotional distress as indicated by 70% with elevated

Table 2. Psychometric Properties of SPTSS-Based PTSD Diagnosis

SPTSS-Based PTSD diagnosis by item cut-off scoring method ^a	Sensitivity	Specificity	Hit rate	PPV	NPV	Kappa coefficients for PTSD diagnosis ^b
≥3.0	.98	.71	.75	.37	.99	.41, $p < .001$
≥4.0	.98	.72	.76	.37	.99	.42, $p < .001$
≥5.0	.98	.75	.79	.40	.99	.46, $p < .001$

Note. SPTSS = Screen for Posttraumatic Stress Disorder (SPTSS); PTSD = posttraumatic stress disorder; PPV = positive predictive value; NPV = negative predictive value.

^aUsing *DSM-IV* (*Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*; American Psychiatric Association, 1994) PTSD criteria.

^bRate of agreement between SPTSS-generated PTSD diagnosis and Structured Clinical Interview for *DSM-IV* (SCID-) based PTSD diagnosis.

Table 3. Indices of Health and Functioning in SPTSS True-Positives and False-Positives

	True-Positive ^a		False-Positive ^a	
	<i>N</i> (%)	OR (95% CI) ^a	<i>N</i> (%)	OR (95% CI) ^a
Poor health status	23 (56.1)	22.90 (9.96–52.63)	4 (13.3)	2.76 (0.84–9.08)
Worse health status than last year	22 (53.7)	5.17 (2.58–10.35)	13 (43.3)	3.42 (1.55–7.54)
During the past 6 months:				
Frequent illnesses	14 (34.1)	12.24 (4.96–30.22)	7 (23.3)	7.18 (2.50–20.67)
Frequent visits to primary care	14 (34.1)	5.03 (2.32–10.91)	8 (26.7)	3.53 (1.41–8.81)
Frequent visits to specialized care	16 (39.0)	16.85 (6.75–42.07)	4 (13.3)	4.05 (1.17–14.08)
Stomachaches	12 (29.3)	8.84 (4.10–19.06)	7 (23.3)	6.50 (2.30–18.39)
Headaches	18 (43.9)	8.84 (3.58–21.84)	8 (26.7)	4.11 (1.62–10.41)
Rapid heartbeat	16 (39.0)	21.85 (8.21–58.16)	5 (16.7)	6.83 (2.02–23.22)
Oversweating	22 (53.7)	7.47 (3.66–15.28)	16 (53.3)	7.38 (3.30–16.51)
Physical problems, pain, fatigue	33 (80.5)	9.23 (4.07–20.92)	15 (50.0)	2.24 (1.04–4.81)
Daily impairment in functioning due to physical problems	31 (75.6)	10.08 (8.16–40.07)	11 (36.7)	3.38 (1.48–7.69)
Daily impairment in functioning due to emotional problems	34 (82.9)	24.29 (10.07–58.54)	20 (66.7)	10.00 (4.36–22.93)
Impairment in familial and social role functioning due to physical or emotional problems	28 (73.7)	54.60 (21.62–137.9)	8 (29.6)	8.21 (2.99–22.53)

^aReference category is SPTSS (Screen for Posttraumatic Stress Disorder) true-negatives and false-negatives, i.e., respondents with mean SPTSS scores < 5.50.

symptoms of depression, yielding a 6-fold increased likelihood for HSCL-25 mean scores above the 1.75 cut-off (OR = 6.25, 95% CI = 2.74–14.24); and by 53% with *DSM-IV* SCID diagnoses other than PTSD (OR = 12.5, 95% CI = 5.46–28.72).

Similarly, in comparison with respondents with SPTSS scores below the cut-off (true-negatives and false-negatives), the SPTSS false-positive group also reported increased likelihood for several indices of health and health-related functioning. Results of individual logistic regression analyses with both true-positive and false-positive groups as covariates are presented in Table 3. Although clearly not as severe as the true-positives, the false-positive group seems to be easily differentiated from the healthier, SPTSS negative group.

DISCUSSION

In this article, we describe the first reported use of the SPTSS, a self-report screen for PTSD, in a culturally distinct setting with a community sample of Bedouin mem-

bers of the Israel Defense Forces. Findings show that not only was the SPTSS readily accepted and easy to administer, but also highly accurate in identifying participants with PTSD, using the SCID as a gold standard. A cut-off score of 5.50 was associated with equal sensitivity and specificity rates of 0.89, indicative of false-negative and false-positive rates of 11%, an associated overall hit rate of .89 and PPV and NPV of .56 and .98, respectively. The high correlation between SPTSS and PSS scores among those with SCID PTSD diagnoses provides strong support for the validity of the SPTSS. These psychometric properties indicate improvement over the initial validation study that employed the Structured Interview for Posttraumatic Stress Disorder (SI-PTSD; Davidson, Smith, & Kunder, 1989) and resulted in several cut-off scores (3.5–5.0) with associated high sensitivity rates (.85–.95), but lower specificity rates (.73–.57; Carlson, 2001).

Selection of a threshold for a screening test is best achieved in accordance with the user's priorities and the specific characteristics of the population at hand (Furukawa, Hirai, Kitamura, & Takahashi, 1997). The current findings demonstrate that lowering the cut-off

score based on SPTSS-derived PTSD diagnosis to increase sensitivity identifies as cases those individuals who although not diagnosed with PTSD by the SCID, are suffering from great symptomatic distress. An anecdotal finding from the interviews implies that the vast majority of men diagnosed with PTSD reported experiencing subsyndromal levels of symptoms for quite sometime before exacerbation to a noticeable dysfunction occurred shortly after discharge (Caspi, Saroff, Suleimani, & Klein, submitted manuscript). Whether this relates to the phenomenon of delayed PTSD requires further investigation; some researchers suggest that the delay is actually in the help-seeking rather than the onset of PTSD (Solomon, Kotler, Shalev, & Lin, 1989), whereas others view partial or sub-threshold diagnoses as potential risk factors for delayed-onset PTSD (Carty, O'Donnell, & Creamer, 2006). The latter view is reinforced by our findings of a subgroup of men, still in service, yet with elevated health problems, health-related impairment in functioning, and increased medical service utilization that scored above the cut-off point on the SPTSS, but did not receive a SCID diagnosis of PTSD.

As previously documented, the degree of comorbidity of PTSD with major depression was also high in this sample (>50%) and further complicated by alcohol abuse. It was a limitation of the study that there were relatively few respondents in each of the different pure diagnostic groups. For this reason, it was not possible to perform analyses to investigate differences in psychometrics across diagnostic subgroups, although these might be clinically important.

One of the limitations of this study is rooted in its sampling method. As in other studies with hard-to-reach or hidden populations, the strategies used drew from aspects of snowball sampling, chain-referral, and respondent-driven sampling (Magnani, Sabin, Saidel, & Heckathorn, 2005). Given the absence of a list of all those serving in the IDF, it was not possible to obtain a complete sample or to randomly sample from a population. Using recruiters from each tribal family in the village was one of the mea-

sures taken to reduce any bias due to personal networks. Nevertheless, there is no way to estimate the number of households that were not located or to determine whether those who refused to participate were different from those who did participate.

The sample also varied in time and length of service. Although it would have been preferable to have a more homogeneous sample in this regard, it is unlikely to have caused a meaningful bias; during the years in question, Israel was involved in multiple security-related events that were not dissimilar in nature. Although these limitations restrict the generalizability of this validation study, it seems unlikely that the findings of a high prevalence of previously undetected PTSD are specific to only one village. More likely, high rates of trauma exposure and the need for assessment and intervention is common in Bedouin communities far and wide.

In conclusion, the results of the study provide support for using the SPTSS as a screening measure in this population of Bedouin servicemen. First, the fact that the SPTSS is not limited to the single-reported trauma model proved quite fitting to the complex multifaceted events experienced. Second, the fact that the SPTSS was designed to screen for PTSD even among respondents not reporting any trauma may be especially beneficial in a cultural setting where some traumas, such as sexual abuse and domestic violence, are likely to be underreported or not reported at all.

Due to the myriad of comorbid physiological problems that accompany PTSD (Rosenbaum, 2004), it is especially recommended to use the SPTSS as a screen for routine assessment in settings such as primary health care clinics, where physicians are the natural agents for initial contact with persons suffering from trauma-related problems (Shiber, Maoz, Antonovsky, & Antonovsky, 1990). We hope that this research constitutes a step toward providing for the mental health needs of Bedouin servicemen. Future studies may assess whether early identification and intervention with this subgroup prevents PTSD from developing at all or from reaching a chronic course.

APPENDIX

Trauma Event Questionnaire

We would like to ask you about events of the kind that may affect people long after the events are over. Many people experience these types of events and we would like to know whether any of these ever happened to you. Please indicate whether you experienced these events once, more than once, or never. Please refer to events in your civilian life.

1. Were you ever involved in a car accident where somebody was seriously hurt or killed or where you had to receive medical care?
2. Were you ever involved in any other accident where you were severely hurt or somebody else was severely hurt or killed?
3. Has somebody close to you, a friend or relative, ever died suddenly or was killed (not in an accident)?
4. Has somebody close to you, a close friend or relative, ever survived a fatal accident, severe injury or life-threatening illness?
5. Have you yourself ever survived a life-threatening illness?
6. Have you ever witnessed a stranger or somebody you did not know well attack or beat-up somebody else and cause them serious injuries?
7. Has anybody ever threatened to seriously hurt or kill you?
8. Have you ever been physically punished as a child so that marks were left on your body (bruises, burns, broken bones)?
9. Have you ever witnessed violence between family members when you were a child, (e.g., your father hitting your mother)?
10. Were you ever beaten up by somebody close to you?
11. Have you ever been stalked or harassed to the point of feeling threatened?
12. Have you experienced or witnessed something else that we did not ask about and that was very difficult or traumatic (e.g., proximity to a terror attack, diagnosis of a serious illness or condition in a child)?

We would now like to ask you about events you were exposed to during your military service.

13. Have you ever experienced military-related traumatic events, such as when you felt your life was in danger or when you witnessed others get killed or seriously hurt?
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